East Park Effluent (Outfall 001) Additional Discussion

August 13 Addendum to Section I – Part 10 – Water Flow Diagram and Narrative Description - Outfall 001

Of the July 21, 2010 NPDES Permit Application

East Park – Outfall 001 – Additional Discussion

CMS Land Company LTBEP is proposing to co-mingle the leachate from East Park (after acid neutralization) with groundwater from upgradient wells before discharging through outfall 001 to Lake Michigan. The co-mingled effluent is projected to meet all Water Quality Standards including the 1.3 ng/L standard for mercury, as well as the toxicity requirements of Rule 1219.

The upgradient groundwater collection wells at EP are required to be pumped and discharged to the lake as part of the remediation process. The collected groundwater will be co-mingled with the EP effluent prior to discharge. Pumping these wells is a necessary step in the leachate treatment as it will intercept the groundwater flow, minimize the water flowing through the CKD, and thus reduce the quantity and improve the quality of leachate collected. Over time, the pumping and co-mingling will improve effluent quality.

CMS is not proposing to treat the East Park (EP) leachate with ultrafiltration (UF) prior to co-mingling or discharge because the results of the UF pilot studies conducted at the Development suggest that the UF technology has an effective treatment limitation for mercury of about 3 ng/L, and the influent at East Park has an average mercury concentration of 5 ng/L (current range 0.6 to 14 ng/L). Treatment of the EP influent with UF would not provide a significant reduction in mercury and would not on its own meet the 1.3 ng/L standard. The Company is planning to treat the EP leachate using Captur Technology within the near future. A Captur Technology Pilot system is currently being tested at the site and the technology is expected to be ready for use in a full scale system by mid-2012. The Captur Technology Pilot system has been able to reduce mercury concentrations in the EP waste stream to levels below the 1.3 ng/L standard.

UF technology has a treatment limitation for mercury based of the results ECT UF Pilot Study conducted at the Development. During the study 14 individual UF runs were conducted on leachate containing various mixtures of seep influent. The influent mercury concentrations in these runs ranged from 15.1 to 544 ng/L and the effluent concentrations averaged 3.8 ng/L. The UF Pilot Study runs were of short-duration. The literature on the treatment of mercury with full-scale UF systems operating continuously to optimize efficiency indicates that final effluent concentrations for mercury would likely be somewhat higher than is achievable in pilot scale systems. The data from the 14 runs suggests UF technology in a full-scale system could not efficiently or consistently reduce mercury concentrations in effluent at influent concentrations of 5 to 15 ng/L.

In addition to UF and Capture Technology, CMS has investigated numerous mercury treatment technologies and disposal options including transporting/piping the EP leachate to the Development treatment system for treatment; none of which constitute a prudent and feasible alternative for the long-term disposal of leachate collected at EP. The limitations of some of those options/technologies are summarized below and are discussed in the original application documentation.

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Piping/transporting EP leachate to the Development – CMS has investigated this option and transporting and treating this low level mercury waste at the Development with a UF system would have the same limitations as treating the leachate with UF at the EP site – the technology would not reduce the low influent mercury concentrations in the EP leachate significantly. In addition, construction of a pipeline would take two construction seasons or until 2013. CMS is anticipating treating the leachate at EP using Captur Technology by mid-2012. Beyond the construction considerations are the legal challenges of obtaining the easements necessary for instillation of the pipeline. CMS is not a public utility and therefore does not have any legal right to obtain those easements. The challenges and negotiations over easements would likely be lengthy if not unworkable. The transfer of the EP influent to the Development given current conditions and future plans would not be feasible or prudent.

Treatment technologies for mercury in water – CMS has done an extensive world-wide search for treatment technologies for mercury that would reduce levels in the EP CKD leachate. The search has found that there are currently no feasible full-scale treatment methods for treating influent mercury concentrations as low as those experienced at the East Park CKD site to levels called for by current Water Quality Standards. Pilot scale studies indicate Captur Technology has a high potential of achieving the standards at EP. Some of the technologies investigated include:

Use of Iron Mine Tailings (taconite) – this technology is only able to reduce an influent mercury concentration of ~200 ng/l to ~10 ng/l. It requires the use of lime, ferric chloride, cationic and anionic polymers and caustic soda to remove pollutants, and the use of large ponds or clarifiers for settling. The technology also generates large amounts of solids that have to be landfilled.

Precipitation/Co-precipitation – Parsons Group tested this method at Bay Harbor using a lamella clarifier to remove solids. The tests were conducted concurrent to the initial Parsons UF Pilot study. The test found that UF had higher mercury removal rates, lower operating costs, and lower maintenance requirements. This technology uses chemical additives to convert metals to insoluble solids. The solids are then removed by clarification and landfilled.

Bioremediation/biological treatment – Involves the use of microorganisms that act directly on contaminant species or create ambient conditions that cause the contaminant to precipitate/co-precipitate from water. Bioremediation has been shown to be effective in pilot-scale studies for water treatment however full-scale operations have not been tested. Similarly, biological treatment has been tested at pilot scale for ex situ treatment of mercury-contaminated wastewater in a limited number of projects. Additional full-scale testing is needed before it can be considered an option for use.